Remarks

A. Period For Reply

Applicant was given one month plus extensions from the mailing date of the Notice of August 16, 2005 to file a response. August 16, 2005 plus one month was September 16, 2005. September 16, 2005 plus two months is Wednesday, November 16, 2005. This Amendment and Remarks is being filed on or before Wednesday, November 16, 2005 with a petition for extension of time for two months.

B. Status

The Office Action was non-final.

C. Disposition Of Claims

Claims 8-33 are pending.

D. Application Papers

This application includes no drawings.

E. Priority under 35 U.S.C. §§ 119 and 120

Acknowledgment of the claim for foreign priority was made in the Office Action of March 7, 2005. This is appreciated.

Acknowledgment of the receipt of the priority document was made in the Office Action dated March 7, 2005. This is appreciated.

As to domestic priority, this case does not claim domestic priority.

F. Attachments

Applicant has filed seven PTO-1449 forms in this case (six with the filing of this case on January 6, 2002 and one

on October 13, 2004). All of the forms have been signed and returned. All of the listings of references have been initialed. Such is very much appreciated.

G. Basis for new claims 8-33

Basis for new claim 8 is found at least in original claims 2 and 3.

Basis for new claim 9 is found at least in original claim 1.

Basis for new claim 10 is found at least in original claim 1.

Basis for new claim 11 is found at least in original claim 1.

Basis for new claim 12 is found at least in original claim 4.

Basis for new claim 13 is found at least in original claim 5.

Basis for new claim 14 is found at least in original claim 1 and on page 10, lines 2-4 of the specification.

Basis for new claims 15-33 is found at least in original claims 6 and 7. Further basis is found from page 4, line 5, to page 6, line 2 of the specification.

H. The Office Action

H.1. Sections 1-3 of the Office Action

In section 1 of the Office Action, a quotation of the second paragraph of 35 U.S.C. 112 was set out. In section 2 of the Office Action, claim 7 was rejected under 35 U.S.C. 112, second paragraph, as being indefinite. Section 3 of the Office Action explains the basis for the rejection.

This rejection is respectfully traversed. However, to expedite prosecution of the application, claim 7 has been

canceled.

H.2. Sections 4-5 of the Office Action

In section 4 of the Office Action, 35 U.S.C. 101 was set out. In section 5 of the Office Action, claim 7 was rejected under 35 U.S.C. 101.

This rejection is respectfully traversed. However, to expedite prosecution of the application, claim 7 has been canceled.

H.3. Sections 6-7 of the Office Action

In section 6 of the Office Action, paragraphs "b" and "e" of 35 U.S.C. 102 were set out.

In section 7 of the Office Action, claims 1-6 were rejected under 35 U.S.C. 102(b) as being anticipated by Tazaki et al. (5,264,627). To expedite prosecution of this application, claims 1-6 have been canceled. Further, this rejection is respectfully traversed on the basis of applicant's discussion in section I. of this paper.

H.4. Section 8 of the Office Action

In section 8 of the Office Action, claims 1-6 were rejected under 35 U.S.C. 102(e) as being anticipated by Matsumoto et al. (6,808,689). To expedite prosecution of this application, claims 1-6 have been canceled. Further, this rejection is respectfully traversed on the basis of applicant's discussion in section I. of this paper.

I. Applicant's discussion

I.1. The claimed invention:

The claimed fixed-bed shell-and-tube reactor is a reactor which embodies an ideal condition such that the

amount of the solid particulate material such as catalyst being packed in each reaction tube is uniform and that the pressure drop due to the packing of the solid particulate material such as catalyst in each reaction tube is uniform.

I.2. Tazaki patent:

The Tazaki patent relates to a method in which a solid packing is packed into an empty space in a gas outlet part of a reaction tube in order to prevent a formation of a diketone which is a by-product in a production of methacrylic acid (e.g. claim 1).

As indicated by the Examiner, col. 8, lines 54-59 of the Tazaki patent reads "the aforementioned former-step catalyst was packed in the form of a bed 1,700 mm in height." However, no teaching for the claimed uniform pressure drop is found anywhere in the Tazaki patent.

Furthermore, the Examiner contends that if the length of the packed layer in each reaction tube is in the claimed uniform range, then the pressure drop in each reaction tube is also inherently in the claimed uniform range. However, as is evident from the below-mentioned data shown in the present application specification, this contention of the Examiner's is based on an erroneous assumption of the facts.

Shown in Table 1 on page 19 of the present application specification are the packed layer lengths and the pressure drops as results of having packed the catalyst (1) in the packing times of 15-120 seconds per liter of the catalyst (1). According to this Table 1, in the case where the packing time is 15 seconds, the packed layer length is 2500 mm, and the pressure drop is 4440 Pa (Comparative Example 1). In addition, in the case where the packing time is 30 seconds, the packed layer length is 2300 mm, and the pressure drop is 5900 Pa (Example 2). These data show that: when the ratio

between the packed layer lengths is 109 % (= (2500 mm (Comparative Example 1)/2300 mm (Example 2)) x 100), the ratio between the pressure drops is 75 % (= (4440 Pa (Comparative Example 1)/5900 Pa (Example 2)) x 100). The above ratio of 109 % between the packed layer lengths is within the claimed range of 90 to 110 %, but the above ratio of 75 % between the pressure drops deviates from the claimed range of 85 to 115 %. Therefore, the above contention of the Examiner's is based on an erroneous assumption of the facts.

Furthermore, as shown by the expression (5-168) given on page No. 5-52 of Chemical Engineer's Handbook 5th Edition (please see a copy thereof being transmitted herewith as Exhibit A, five pages), the pressure drop (Δp) is proportional to the packed layer length (L). Therefrom, it follows that: if the packed layer length of 2500 mm (Comparative Example 1) is decreased to the same as 2300 mm (Example 2) (i.e. the ratio between the packed layer lengths is made 100 %), then the pressure drop of 4440 Pa (Comparative Example 1) decreases to 4085 Pa (= 4440 Pa x (2300 mm/2500 mm)). This pressure drop value of 4085 Pa is 69 % of the pressure drop of 5900 Pa (Example 2) and therefore more deviates from the claimed range of 85 to 115 %. Therefore, the above contention of the Examiner's is also based on an erroneous assumption of the facts.

For the above reasons, we believe that the novelty of the claimed invention is not denied by the Tazaki patent.

I.3. Matsumoto patent:

The Matsumoto patent relates to a method for making the temperature distribution of a heat medium uniform in a reactor.

As indicated by the Examiner, the Matsumoto patent discloses that an inactive substance is preferably packed uniformly (col. 19, lines 34-38). However, as described in col. 19, lines 34-35 of the Matsumoto patent, this uniform packing of the inactive substance is "For the purpose of effectively cooling the reaction gas" and is therefore different much from the concept of the claimed invention. In addition, no teaching for the claimed uniform pressure drop is found anywhere in the Matsumoto patent.

Furthermore, the Examiner contends that if the length of the packed layer in each reaction tube is in the claimed uniform range, then the pressure drop in each reaction tube is also inherently in the claimed uniform range. However, as mentioned above, this contention of the Examiner's is based on an erroneous assumption of the facts.

For the above reasons, we believe that the novelty of the claimed invention is not denied by the Matsumoto patent.

J. Summary

The Examiner is respectfully invited to make contact with the undersigned by telephone if such would advance prosecution of this case.

Date: 11-16-05

Robert J. Jacobson
Reg. No. 32,419

Tel. No.: (651) 699-7900
Fax. No.: (651) 699-7901

650 Brimhall Street South
St. Paul, MN 55116-1511